

# Second Grade: Physical Science

## MAKE IT: Physical Properties

### **Background Information**

Physical properties of matter are those that can be observed without changing the chemical composition of the matter. Size, shape, color, flexibility, texture, solubility, melting point, and odor are just a few physical properties. Using these observations is helpful in classifying matter and determining which materials would be ideal for various uses. For example, something that dissolves in water would not be useful in making beverage cups.

### **Performance Expectations**

**2-PS1-1 Matter and Its Interactions.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

<https://www.nextgenscience.org/dci-arrangement/2-ps1-matter-and-its-interactions>

**2-PS1-2 Matter and Its Interactions.** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

<https://www.nextgenscience.org/dci-arrangement/2-ps1-matter-and-its-interactions>

### **Disciplinary Core Ideas**

PS1.A: Structure and Properties of Matter

Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1)

Different properties are suited to different purposes. (2-PS1-2), (2-PS1-3)

### **Science and Engineering Practices**

Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.

Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-PS1-1)

Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. Analyze data from tests of an object or tool to determine if it works as intended. (2-PS1-2)

### **Crosscutting Concepts**

Patterns in the natural and human designed world can be observed. (2-PS1-1)

Cause and Effect Events have causes that generate observable patterns. (2-PS1-4)

Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2)

**Objectives:**

- Students will observe and record physical traits of objects.
- Students will design and conduct investigations to determine physical traits of objects.
- Students will analyze data and use evidence to determine potential uses of various objects.

**Materials:**

- Make It Power Point
- Make It Student Pages
- Cups Water – Warm and Cold
- Copy/Drawing Paper
- Spoons
- Hand Lenses
- Droppers
- Rulers – If measurement is appropriate for your students
- Plastic Strips
- Paper Towels (for cleaning)
- Packing Peanuts – Soluble and Non-soluble
- Variety of Items for Testing: (*suggestions*)
  - Kool-Aid
  - Packing Peanuts
  - Sand
  - Salt
  - Sugar
  - Pepper
  - Plain Paper Plates
  - Coated Paper Plates
  - Styrofoam Plates
  - Trash Bags

**Advanced Preparation**

Warm water is recommended for use with the investigations.  
Determine what other materials could be used for testing.

**Suggested Implementation**

Use the Make It power point to begin a class discussion. Alternately, you may wish to provide each group with a different picture and host a discussion with the questions from the Make It power point. Prior to beginning the investigations, you may wish to pose questions such as the following to the class and discuss:

- *What is this?*
- *How is it used?*

- *What might be used to make this?*
- *Why would that be used?*
- *How do you think people decide what materials to use when making something?*

Groups of 2-4 are suggested. You may also wish to setup stations. Share with the class that their groups will be working to observe traits/properties of various materials. Introduce the materials available to students.

At this point it is suggested to have dark and light paper, hand lenses, and a variety of materials available for initial discovery. Allow ample time for students to observe and record their observations about the items. They also consider possible uses for the items.

Ask the class to consider and share what additional information could be obtained through different testing. Share with the class what materials will be available for testing to gain more information about the items. Student groups then develop questions they would like to investigate using the materials available. Post student questions.

Allow groups to select which question they would like to investigate. Now students will develop and record a method for testing the materials. Plenty of time should be provided for this phase. Again, students record their observations and suggest a product the item(s) could be used in a product. Evidence from the investigations should be incorporated into their ideas. Student groups would then share their ideas. You may wish to return to the original questions during this phase.

### **Debrief**

- *What types of observations did you make?*
- *Did any of the materials have the same traits/properties? What evidence do you have to support your ideas?*
- *Did any of the materials have different traits/properties? What evidence do you have to support your ideas?*
- *What else would be helpful to know about something before deciding to use it for a product?*

### **Resources**

Book suggestions from: <http://www.kbs.msu.edu/wp-content/uploads/2017/02/NGSS-Interactive-Read-Alouds.pdf>

- Mason, A. (2005). *Touch it! Materials, matter and you.*  
Non-fiction book asking readers to describe various materials through observing, feeling and comparing.
- Beaty, A. (2013). *Rosie Revere, engineer.*  
A little girl works to design something that will help her aunt fly. After multiple failures and encouragement from her teacher, she finally succeeds. Use to introduce the concept of engineering and persevering to solve a problem.

- Stille, D. (2004.) *Matter: See it, touch it, taste it, smell it.*  
The states of matter (solids, liquids, and gases) are explained and demonstrated.  
Includes an experiment to try.

### Assessment

The following single point rubric can be used to assess student understanding. For each of the criteria listed below, either circle the proficient description or add notes to a box indicating why the student's performance was either lacking or exceptional.

Areas that need improvement. <b>Developing Performance</b>	Criteria for <b>Proficient Performance</b>	Evidence of exceeding standards. <b>Advanced Performance</b>
	Can provide examples of physical traits of objects.	
	Can explain in simple term how they would investigate physical traits of objects.	
	Can point out several uses of objects based on their physical traits.	